

## WHAT IS CLAIMED IS:

1. Upgrading apparatus for obtaining a transmit diversity signal for transmission alongside a main R.F. signal using at least one antenna, the apparatus comprising:

an R.F. operable signal extractor for extracting a sample of said R.F. main signal, and

an R.F. operable diversity unit for transforming said R.F. sample signal thereby to form said transmit diversity signal, said apparatus being configured for insertion between at least one R.F. output of an existing cellular base station and a passive diversity antenna, said main R.F. signal being obtained from said R.F. output, thereby to confer upon said existing cellular base station a transmit diversity capability.

2. Apparatus according to claim 1, wherein said existing base station comprises a single R.F. output for transmit signals and at least two R.F. inputs for receive signals.

3. Apparatus according to claim 2, wherein said single R.F. output is a low power output, said apparatus further comprising amplification.

4. Apparatus according to claim 1, wherein said R.F. signal is a low power R.F. signal and said apparatus further comprises amplification circuitry for amplifying said main and said diversity signals.

5. Apparatus according to claim 1, wherein said R.F. signal is a high power R.F. signal.

6. Apparatus according to claim 1, wherein said base station comprises two receive/transmit subsystems, each for transmitting and receiving separate channels.

7. Apparatus according to claim 6, wherein said diversity antenna is for adding to said base station as part of said upgrading.
8. Apparatus according to claim 6, wherein said apparatus comprises two co-located antennas for substituting with said at least one antenna.
9. Apparatus according to claim 6, wherein said apparatus comprises two co-located antenna parts for substituting with said at least one antenna wherein said antenna parts form at least one of a group comprising a two-column antenna and a dual polarized antenna.
10. Apparatus according to claim 1, wherein said passive antenna comprises at least two antenna elements, thereby to provide receive space diversity capability.
11. Apparatus according to claim 1, wherein said cellular base station comprises a CDMA air interface, and wherein said main signal and said diversity signal comprise multiple CDMA carriers.
12. Apparatus according to claim 6, wherein said signal extractor is located in proximity to said R.F. output.
13. Apparatus according to claim 6, wherein said signal extractor is located within a housing configured for connection in proximity to said base station.
14. Apparatus according to claim 6, wherein said R.F. signal is a low power R.F. signal, said apparatus further comprises amplification circuitry for amplifying said main and said diversity signals, and said amplification circuitry is located in proximity to the respective antennas.
15. Apparatus according to claim 14, wherein said amplification circuitry is located within a housing unit configured for connection in proximity to said passive antenna.

16. Apparatus according to claim 15, wherein said housing unit is a modular unit comprising a first module for a main signal path and a second module for a diversity signal path.

17. Apparatus according to claim 6, wherein said cellular base station comprises a plurality of outputs and said signal extractor comprises a signal combiner, said sample comprising a combination of signals from said outputs.

18. Apparatus according to claim 6, wherein said signal extractor comprises at least one directional coupler.

19. Apparatus according to claim 6, wherein said base station comprises a plurality of R.F. outputs and said signal extractor comprises a plurality of directional couplers.

20. Apparatus according to claim 6, wherein said base station comprises a plurality of R.F. outputs, and said signal extractor comprises a plurality of directional couplers and a signal combiner.

21. Apparatus according to claim 1, further comprising an R.F. operable duplexer for providing a dual transmit-receive capability to an antenna, said duplexer being for connection to an existing antenna configured for receiving, to enable said existing antenna to transmit said transmit diversity signal.

22. Apparatus according to claim 1, wherein said existing base station is a multiple air interface base station having a CDMA air interface and at least one other air interface and in which said at least one R.F. output is a low power R.F. output, said apparatus configured to extract a CDMA signal for feeding to said R.F. operable diversity unit whilst leaving signals of said at least one other air interface unchanged.

23. Apparatus according to claim 22, further comprising amplification.

24. Apparatus according to claim 1, further comprising antenna control for providing azimuthal beam squint and azimuthal beamwidth shaping.
25. Apparatus according to claim 24, wherein said antenna control comprises circuitry for adjusting a main lobe tilt.
26. A method of enhancing a base station having a CDMA air interface with receive space diversity capability so as to provide said base station with transmit diversity capability, the method comprising:  
attaching a radio frequency interface unit to an R.F. output of said base station to obtain a sample of a main R.F. signal,  
attaching a diversity unit to said radio frequency interface unit to generate a transmit diversity signal, and  
connecting said diversity unit to a diversity antenna of said base station to transmit said transmit diversity signal.
27. The method of claim 26, wherein said base station comprises a passive antenna array.
28. The method of claim 26, wherein said base station comprises two transmit/receive subsystems, each for sending and receiving distinct channels.
29. The method of claim 28, further comprising adding a further passive antenna to said base station to provide a transmit diversity antenna.
30. The method of claim 28, further comprising replacing at least one existing antenna with two co-located antennas.
31. The method of claim 30, wherein said co-located antennas comprise one of a group comprising a commonly polarized antenna arrangement and a dual polarized antenna arrangement.

32. The method of claim 26, wherein said antenna arrangement comprises at least two spaced antennas to provide receive space diversity capability, the method further comprising attaching a duplexer to a receive diversity antenna of said antenna arrangement to provide said receive diversity antenna with transmit-receive capability, thereby to transmit said transmit diversity signal therefrom.

33. The method of claim 26, wherein said R.F. output is a low power output and wherein said method further comprises adding power amplification.

34. The method of claim 33, further comprising providing said power amplification in close proximity to said antenna.

35. The method of claim 34, further comprising providing said power amplification in two modules, one for a main signal path and one for a diversity signal path.

36. The method of claim 26, comprising providing at least one directional coupler in said radio frequency interface unit for obtaining said sample signal.

37. The method of claim 26, wherein said base station is a multiple air interface base station in which one air interface is CDMA, wherein said R.F. output is a low power output and said connecting said diversity unit comprising setting up a path from said R.F. output to extract a CDMA signal and not to extract other signals.

38. The method of claim 26, wherein said base station comprises one R.F. transmit output and two R.F. receive inputs.

39. The method according to claim 26, further comprising providing antenna control for azimuthal beam squint and azimuthal beamwidth shaping.

40. The method according to claim 39, wherein said antenna control comprises circuitry for adjusting a main lobe tilt.